



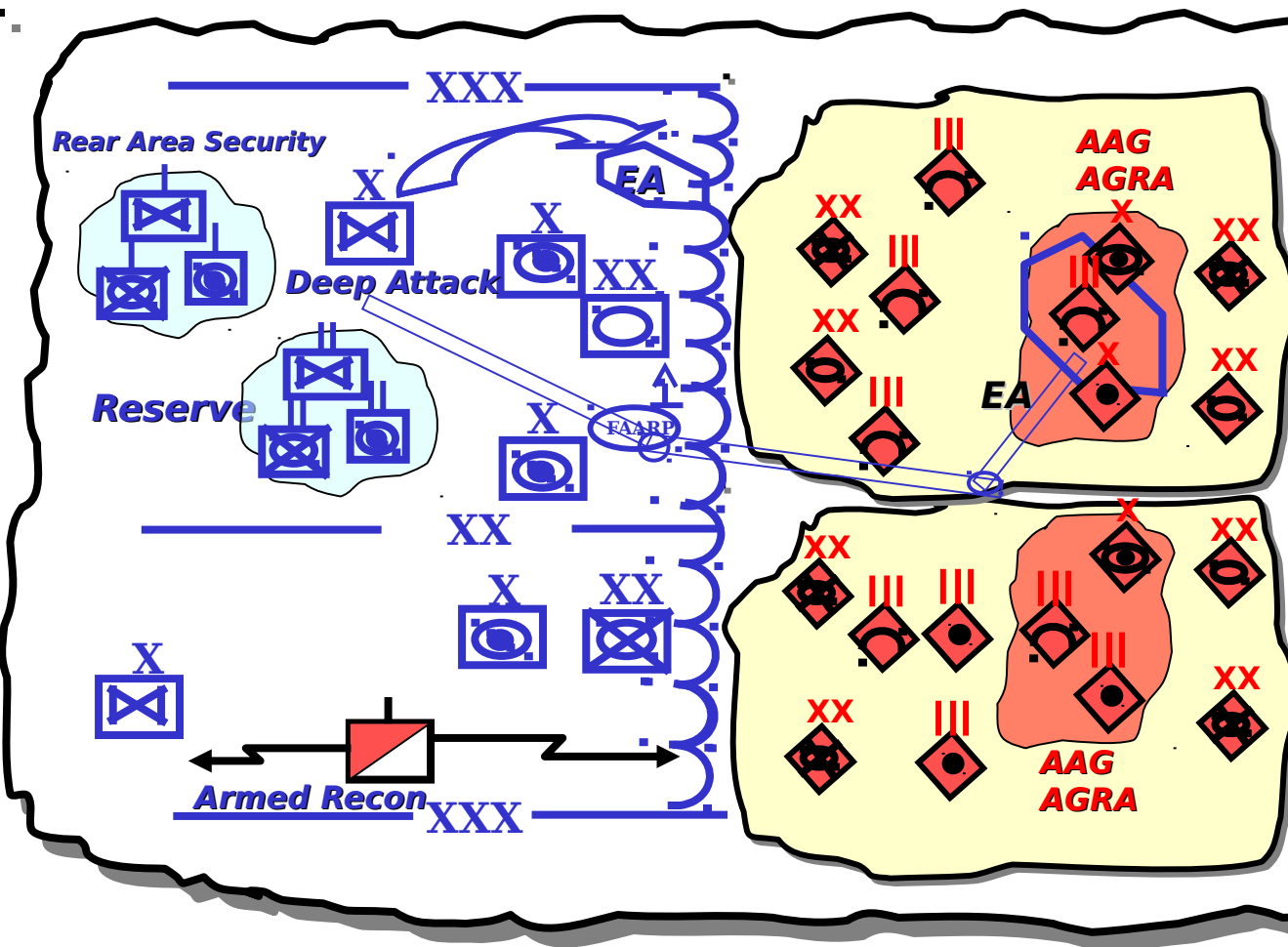
The Changing Strategic Paradigm



Yesterday....Today

Strateg

Defensive... Counterattack Offensive



Conditions

- Linear Battlefield
- Rear Areas (Sanctuary)
- Massed Formations
- Defensive ADA
- Area Lethal SEAD possible

Roles

- Deep Operations
- Maneuver Support
- Lift/Air Assault
- C2

Threats

- Air/Missile Attacks to Airfields
- SOF Attacks/WME
- Artillery/Rocket Attack to FAIRP
- IAD- Protecting Targets and Along Routes
- EW- Jamming Coms, Radars and GPS
- EMP
- Conventional, Non-Air

Today...Tomorrow

Strategy

Offensive

Defensive



Military Systemology

Fire Support

C2

Air Defense

Logistics

ISR

Maneuver

Indirect approach. Attack US systems and sub-systems rather than forces

Conditions

- Non-Linear Battlefield
- No Rear Areas (No Sanctuary)
- Offensive ADA
- Dispersed Targets
- Expanded ISR
- Precision SEAD Required

Roles

- Deep Operations
- Maneuver Support
- Lift/Air Assault
- C2

Threats

- Air/Missile Attacks
- WME
- Direct Fires
- SOF
- Artillery/Rocket Attacks
- Passive Sensors
- EW, Jamming Coms, Radars and GPS
- EMP
- Offensively Focused



Changing Threat Battlespace

Blue Fixed Wing Response

**Altitude
Speed
Countermeasures
Fixed Targets**

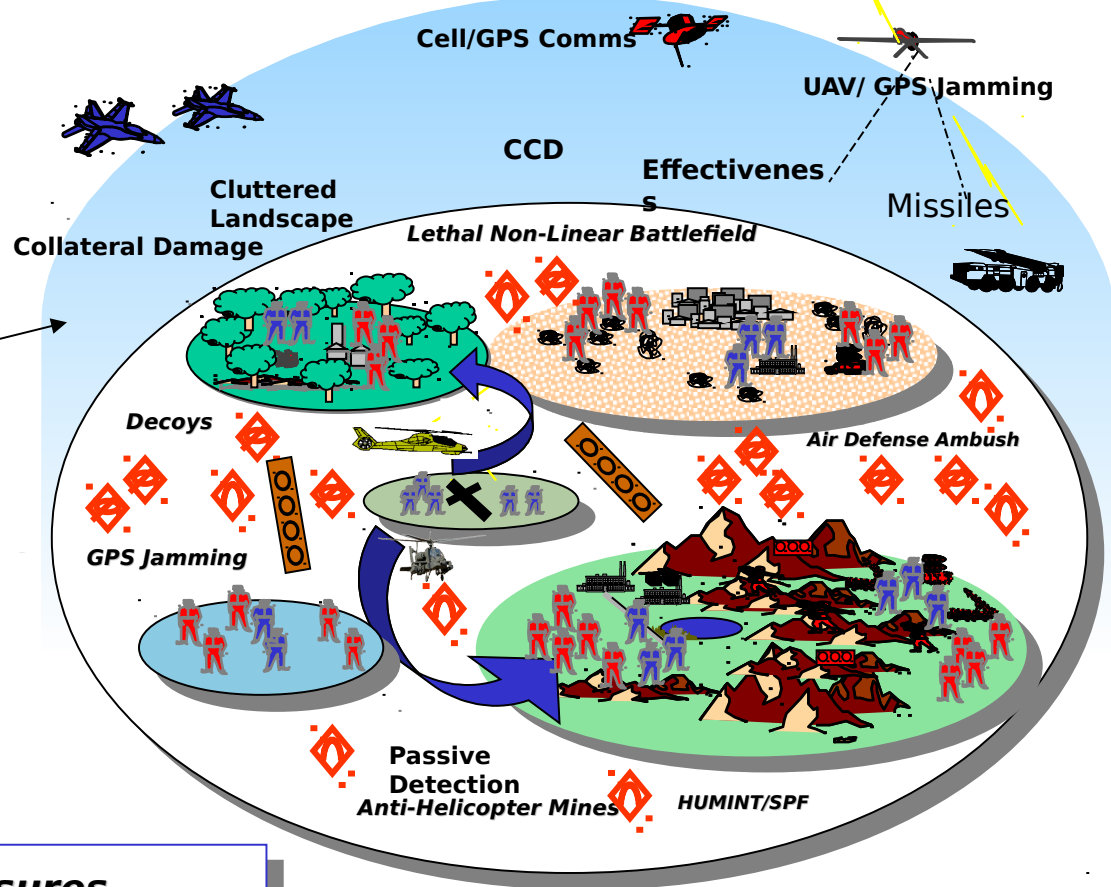
..creates a gap in target acquisition

Blue Rotary Wing Response

**SA/SU
Combined Arms
MuM Teaming**

**Countermeasures
Proactive, Precision SEAD
Precision Fires & Maneuver
TTP**

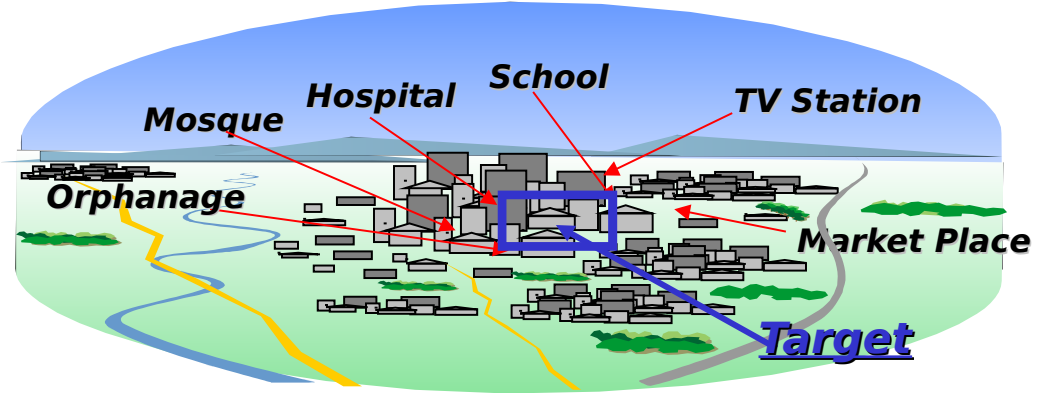
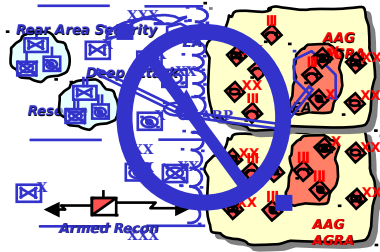
= Responsive, lethal, dedicated Aviation support to dominate the threat



Rotary Wing Aviation fills the gap ... provides close air support to the ground commander

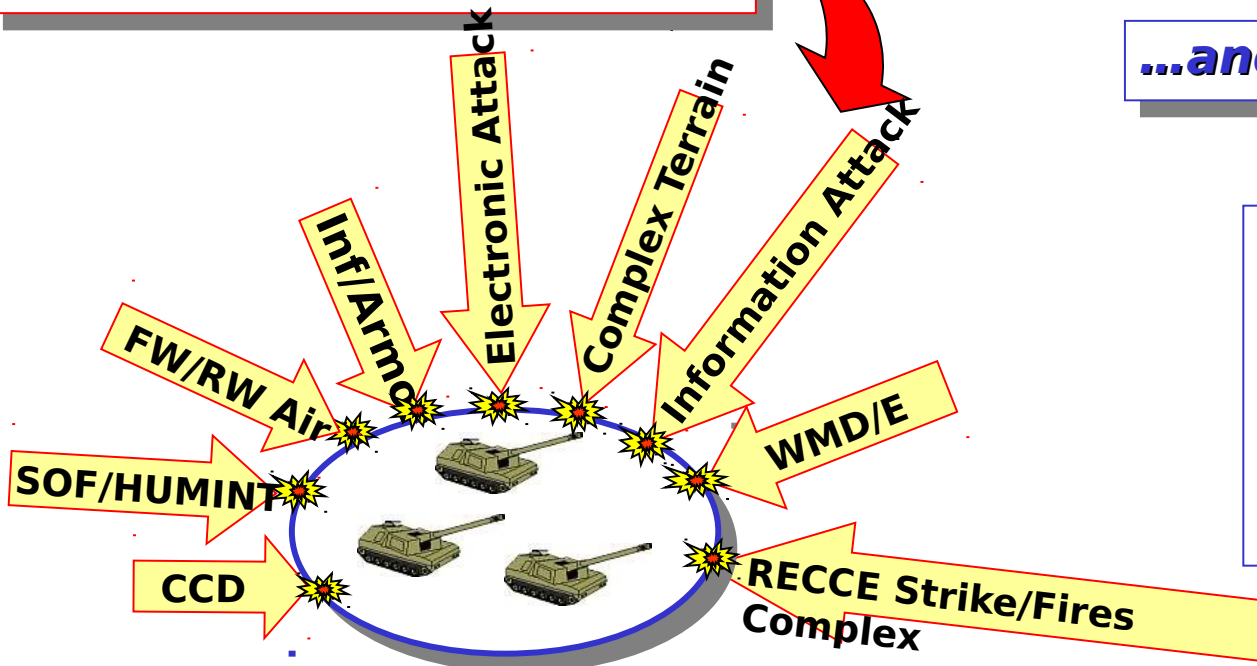
NEW PARADIGM PROBLEM SET

Leverage effects in the new operational environment....



Within these threat strategies....

...and survive



- Review Vulnerabilities
- Trade off analysis
 - Tactics
 - Leadership
 - Personnel
- Account for change of tactics
- Account for new technology

A Future Anti-Access Environment

A Common Strategy for Fighting the US

Threat Construct

Anti-Access Strategy & Capabilities

Conclusions

Discussion

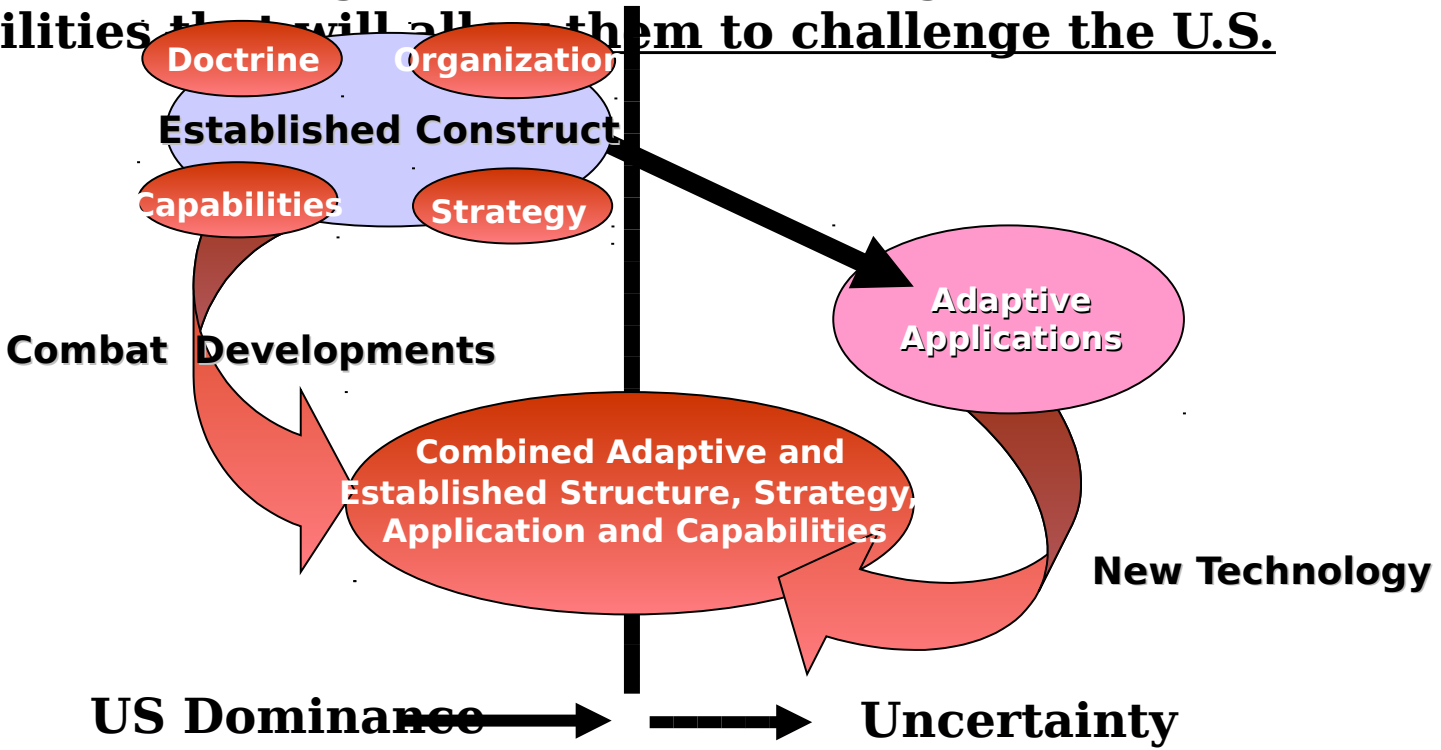


The Common Strategy

All Military Forces in today's world are constructed in accordance with established paradigms. In most cases, this construct is sufficient to meet national needs in regional settings against neighboring states.

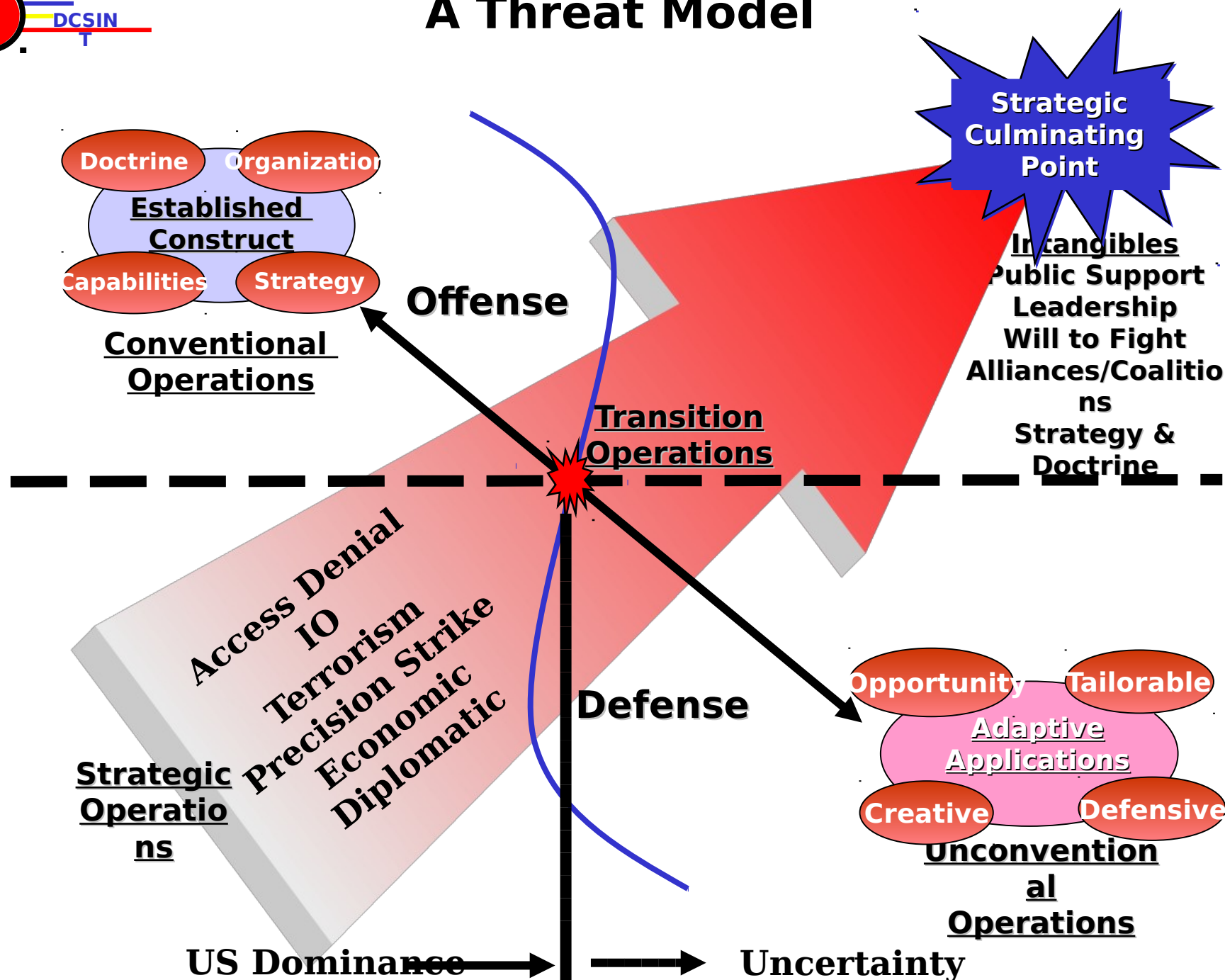
~~U.S. forces, with their technological, organizational and strategic capabilities, dominate conventional, regionally focused militaries.~~
regionally focused militaries use unconventional (adaptive) ways, means and end

Nations with interests contrary to the US use asymmetrical designs and new technologies to develop capabilities that will allow them to challenge the U.S.





A Threat Model



Threat Capabilities

Conventional Operations

Internal Security

Local, Regional, National &
Secret Police
Para-military Organizations
Civilian Mobilization

Regional Threats

Armored and Mechanized Forces
Long Range Artillery and Rockets
Fixed and Rotary Wing Air Forces
UAVs and Night Vision
Medium Range Missiles
Coastal Navy
HUMINT/SOF

Access Denial

IO

Transition Operations

Transition

Engineers
Pre-positioned - logistics
Hardened C2
Deception

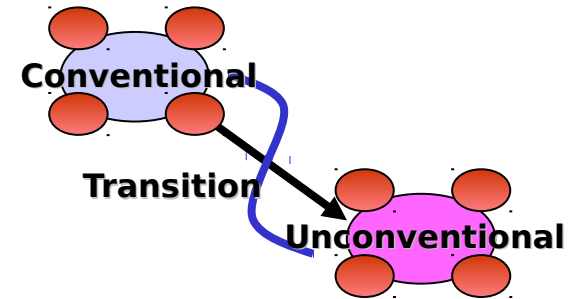
Protecting Regional Gains

Armored and Mechanized Forces
Regional Police
Rotary Wing Air Forces
HUMINT/SOF

Access Denial

Air and Missile Defenses
Theater Ballistic Missiles
Chemical/ Biological Weapons
HUMINT/SOF

Strategic Operations



Unconventional Operations

Preservation

Camouflage, Concealment,
Cover Deception and Denial
Redundant C2

Access Denial

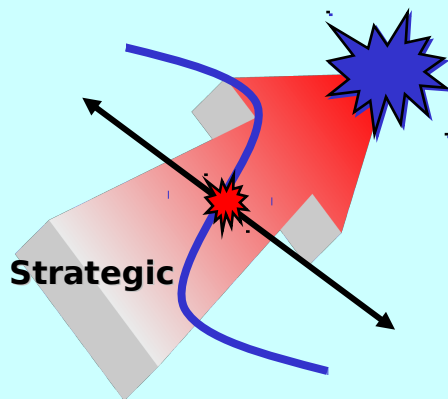
Counter - precision, ISR &
mobility

Controlling the Conflict Environment

All Elements of National
Power

Precision Fires & Recon
Strike

Mobile/ Mechanized Reserves
Commercial Technical ISR



Information Operations: EW, cyber-
attack, protection and security

Diplomatic initiatives

Economic leverage

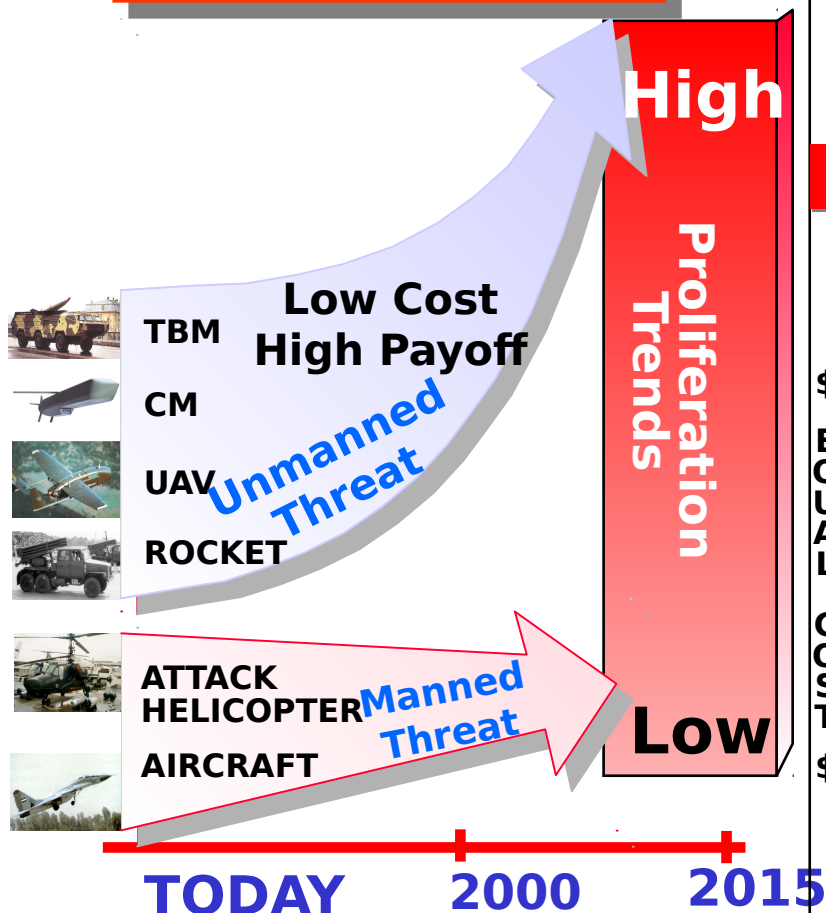
Terrorist attacks

Precision strike - TBM

Weapons of Mass Effects

AIR AND MISSILE THREAT (U)

CHANGING THREAT



HOW IT'S CHANGING

*Applying Lessons Learned...
Adoptive and Adaptive*

Emerging Capabilities

Emerging Strategies

GIVEN \$70M, ANY ADVERSARY COULD BUY...

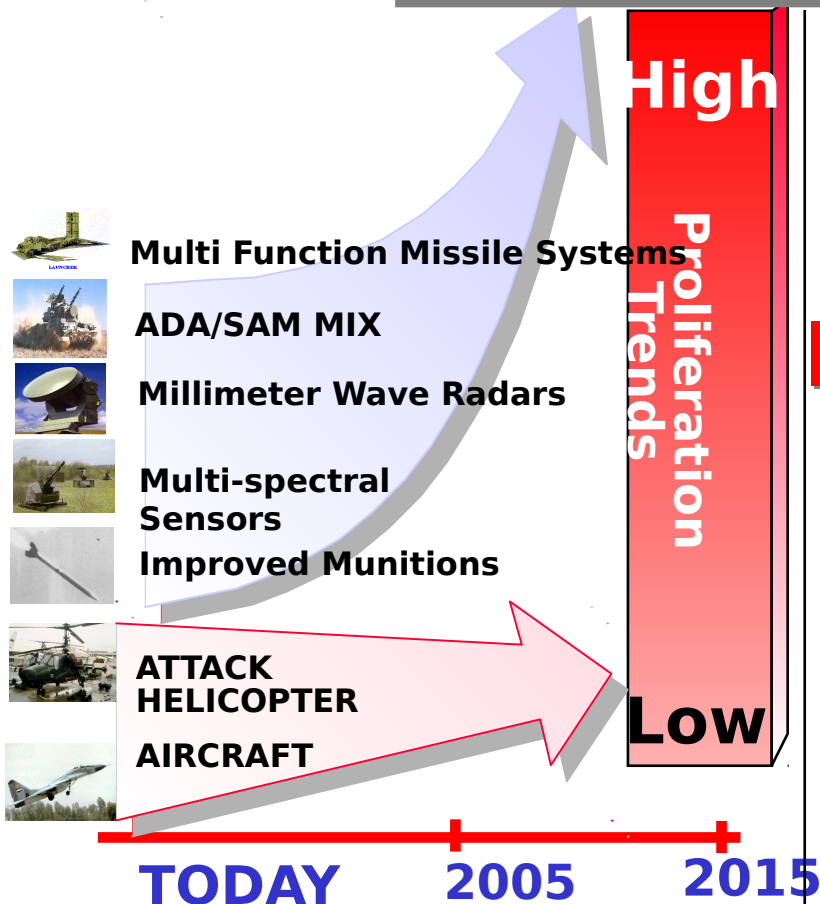


**INCREASING
RISK TO
US
FORCES**

**EVOLUTION CHARACTERIZED BY PROLIFERATION
OF LOW COST, UNMANNED WEAPONS**

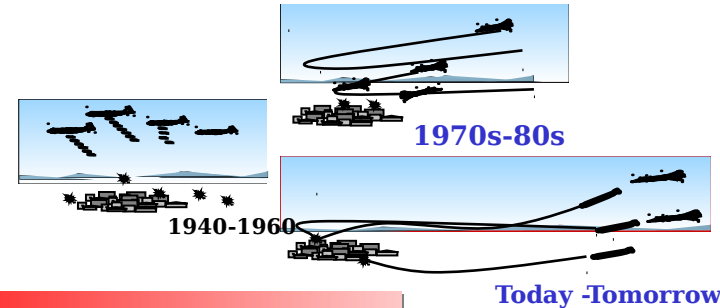
General Air Defense Trends

WHY IT'S CHANGING



EVOLUTION CHARACTERIZED BY CHANGE IN THE TARGET SET

Applying Lessons Learned... Adoptive and Adaptive



Emerging Capabilities

Multi-spectral sensor integration

NOE/OTH Radar capability

Integration of gun and missile

Advanced munitions

Enhanced targeting

Emerging Strategies

Opportunistic in nature

Redundant C3I

Dispersed, Integrated, and Decentralized engagement

Mixed automated and manual tracking-- win war of weather

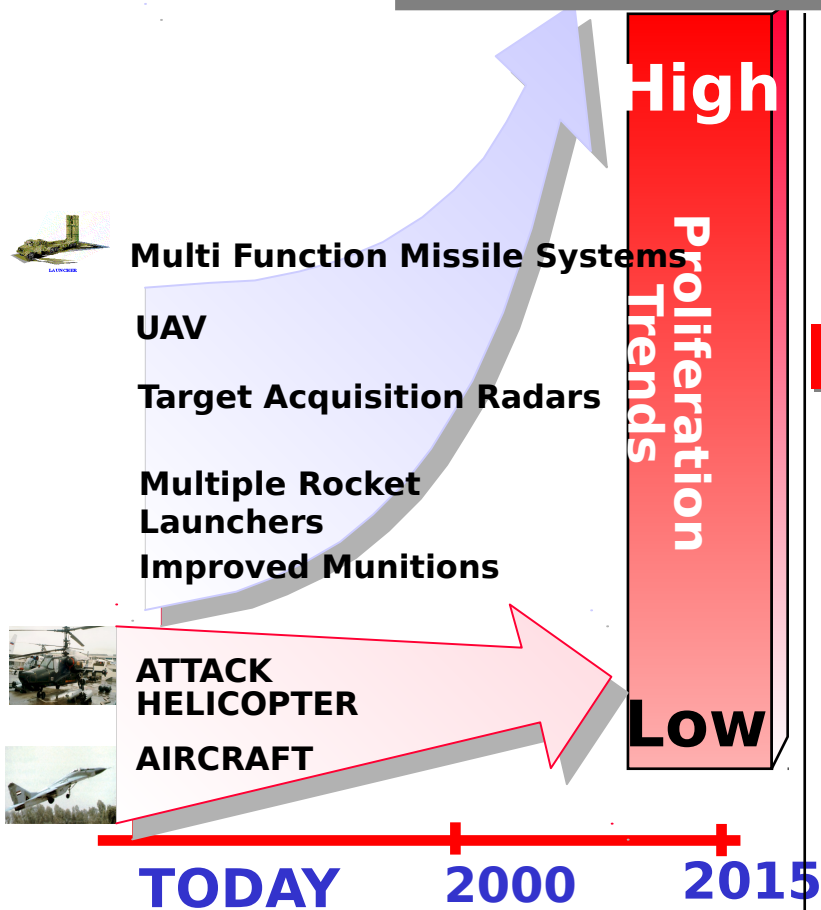
Maximum use of complex terrain

Non Traditional Air Defense Employment ... Air Defense Ambush

General Artillery Trends

WHY IT'S CHANGING

*Applying Lessons Learned...
Adoptive and Adaptive*



Emerging Capabilities

Decreased Logistics
Advanced munitions
Enhanced targeting

Emerging Strategies

Opportunistic in nature
Redundant C3I
Dispersed, Integrated, and Decentralized engagement
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Maximum use of complex terrain

INCREASING RISK TO US FORCES

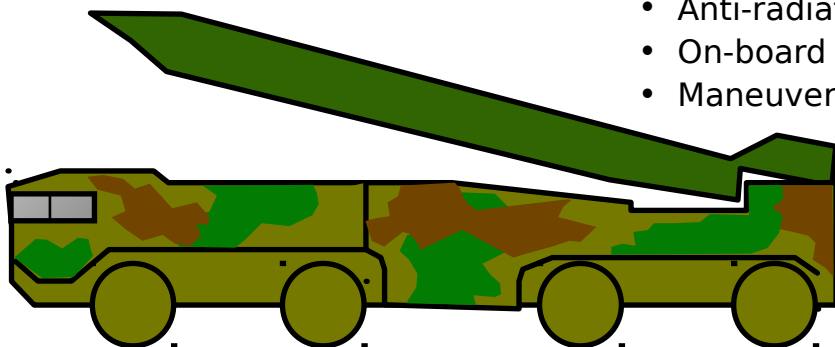
EVOLUTION CHARACTERIZED BY CHANGE IN THE TARGET SET



SRBM Trends

Guidance & Control:

- Active Attitude Control System
- Inertial Guidance w/Terminal Digital Correlation
- On-board Digital Flight Computer



Improved Warhead Options:

- Enhanced Blast
- NBC / Fuel Air Explosive
- Improved ICM
- Terminally Guided Homing
 - Subminitions
- Anti-radiation Homing
- On-board Target Acquisition
- Maneuvering

Most Common
FROG-7 (RS)
SCUD Variants
SCUD-B (RS)
Al Hussein (IZ)
No-Dong (NK)
SS-21 (RS)

State of the Art
SS-21 (RS)
SCUD-B (RS)

Propulsion

Solid Fuel

Transporter Erector Launcher

- Survivability:
 - Low Observable Features
 - NBC protection
 - Lightweight armor
- Automated Fire Control
- SATCOM Digital Downlink: C3, GPS, TA, FD
- Shorter set-up time

Accuracy & Range:

- Range: Minimum 100 km
Maximum 1000 km
- CEP: 10m at min range
< 100m at max range

Staging





Multiple Stages



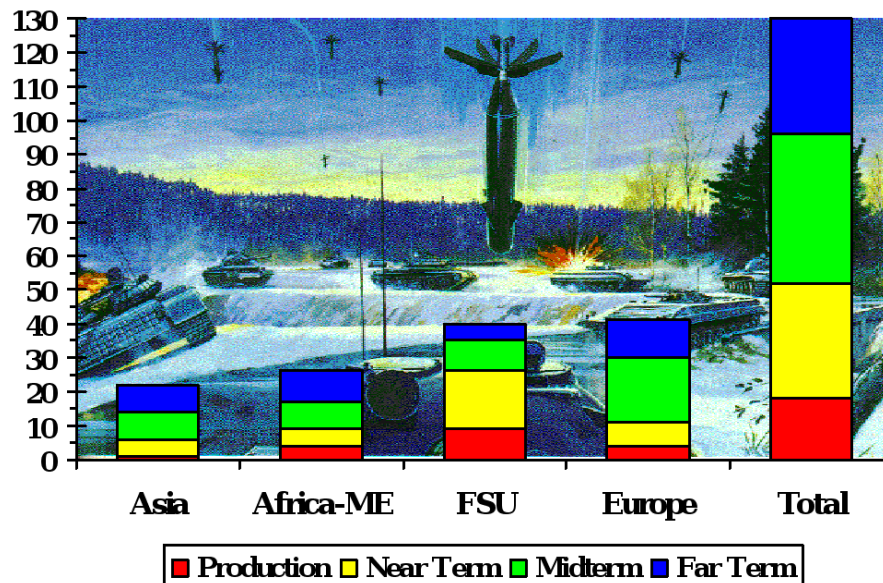
The Poor Man's TBM



***MRLs Provide Capability To Deliver Long Range Precision Munitions
without TBMs***

-  LASER GUIDED PROJECTILES PROLIFERATING RAPIDLY
-  FOUR NEW SENSOR FUZED MUNITIONS IN PRODUCTION
-  COURSE CORRECTED MUNITIONS COMMON
-  TERMINALLY HOMING MUNITIONS BEING TESTED

Strategies
Mobility
Massed Effects
Lethality..CML Capability
Sanctuary Operation





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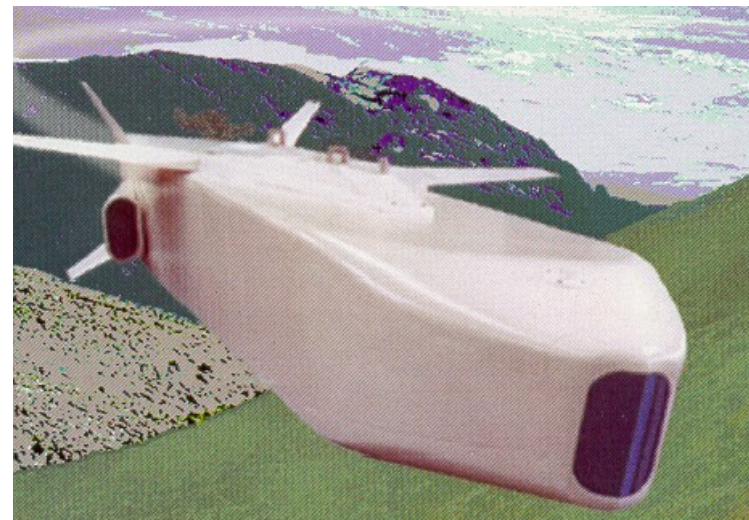
LAND ATTACK CRUISE MISSILE TRENDS



- **SMALLER SIZE**
- **INCREASED RANGE**
- **LOWER ALTITUDE FLIGHT**
- **IMPROVED ACCURACY**
- **FUTURE USE OF SMART SUBMUNITIONS**
- **POSSIBLE INCORPORATION OF COUNTERMEASURES**

Strategies

Long Range Attack
Deny Theater Basing
Reduce Air Force Requirement
Precision Attack
Low Cost



- **Serious theater-level threat possible before 2005**
 - **At least 11 countries now developing LACMs**
 - **Majority of systems are subsonic**
 - **Simple LACMs could emerge quickly (Maybe Not)**
 - **Anti-ship cruise missile (ASCM) and UAV conversion**

**ACMS CAN STRIKE TARGETS ACROSS THE
THEATER OF OPERATIONS**

AIRCRAFT TRENDS

- ***Increased Use Of PGMs/Cruise Missiles***
- ***Increased Stand-off Range***
- ***Reduced Radar Cross Section***
- ***Increased Aircraft Survivability***
- ***Increased Multi-role Variants***



Strategies
Regional Dominance
Potential Air Threat
Survivability vs.. Attack

AIRCRAFT CAN STILL REPRESENT A LETHAL THREAT..

HELICOPTER TRENDS

- ***Increased Stand-off Range***
- ***Improved Accuracy***
- ***Better Night & Adverse Weather Capability***
- ***Improved Aircraft Survivability Systems***
- ***Improved IR Signature Reduction Technology***



Strategies

Regional Overmatch

Reconnaissance

Limited Attack w/ Conditions

Attack Helicopters Are A Dangerous Threat To The Maneuver Force



Artillery Trends

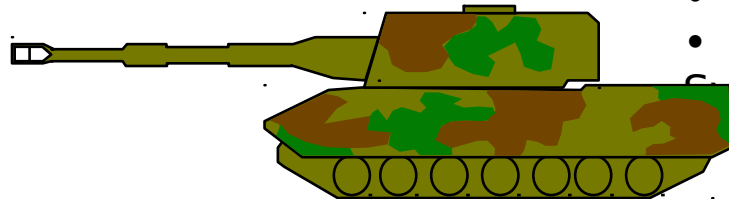
Increased Range

Cannon: 40 - 50 km

- 45-52 Caliber length tube

- Propellant - LPG

MRL: 50 - 90 km (max 150 km)



Decreased Engagement Time

- Direct Sensor to Shooter Link

- UAV
- IR, EO/MMW
- GPS / INS
- Automated Fire Control System (AFCS)

Rate of Fire: 8-12 RPM

Accuracy & Lethality

Accuracy:

- Smart Munitions: small search area (hit probability >.5)

Lethality:

- Fuzing
- Explosive Fills (RDX & HMX)
- Controlled Fragmentation
- Improved Metallurgy

• ICM, DPSCM, Scatterable

Mines

Supportability

- Pallatized Ammunition
- Combustible cartridge
- 152 155 mm systems conversion
- Modular Propellant
- Multi-Option Fuzing

State of the Art

2S31 120mm Combo Gun (RS)

GHN-45 155mm How (AU)

2S19 152mm SP How (RS)

G-6 155mm SP How (SF)

ASTROS II & III MRL (BR)

Laser Guided Projectile (LGP)

Sensor-Fuzed Munition (SFM)

Course-Corrected Munition (CCM)

Terminally Homing Munition (THM)

ADHPM - 2000 to 2015

Krashopol 152/155mmLGP (RS)

Hong Tu Di 152mm LGP (CH)

Kitolov 120/122mm LGP (RS)

Smel'chak 240mm LGP (RS)

Ugroza 122mm LG Rocket (RS,IR)

Bussard 120mm LG Mortar (GE)

Ukranian 120mm LG Mortar

Motiv 3M SFM (RS)

Universal 122, 220, 300mm SFM (RS)

SMArt 155mm SFM (GE)





MRL

PROLIFERATION

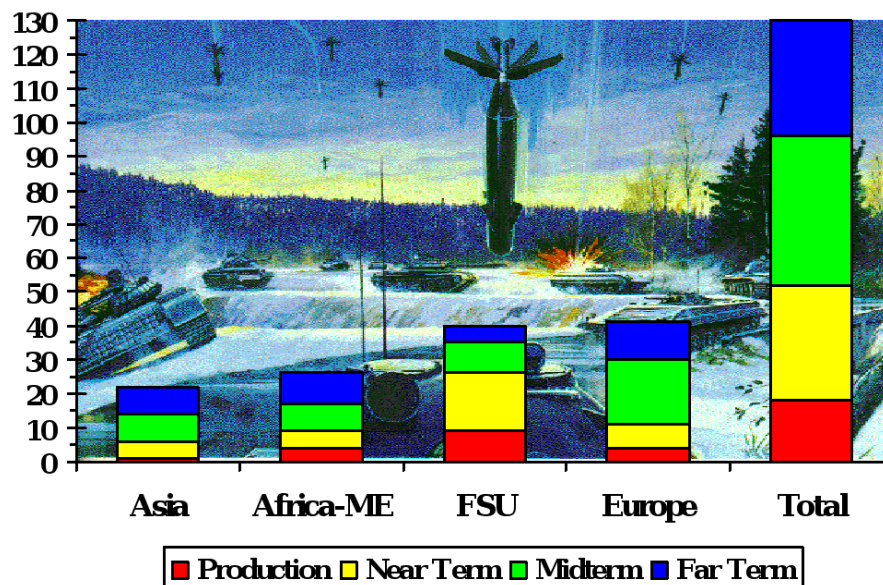
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Strategies
Mobility
Massed Effects
Lethality..CML Capability
Sanctuary Operation



UAV - Trends

Attack UAV

- **TARGETS**
 - AIR DEFENSE RADARS
 - ARMOR
 - C2
 - **PASSIVE SENSORS**
 - IR
 - RF SEEKERS
 - ACOUSTIC
 - **SMALL WARHEADS**
 - HE - POSSIBLE CHEMICAL
 - FRAG - POSSIBLE BIOLOGICAL
- 40 + countries developing/using UAVs
• Difficult to detect, track, and destroy
• UAVs are proven force multipliers



Reconnaissance UAV



Electronic Warfare UAV



Dispensing Jammer/EMP Burst

Dedicated Comms Jammer

Strategies

Reduce Air Force Requirement
Near Real Time Intelligence
Degrade Digitized Battlefield
Preserve Force



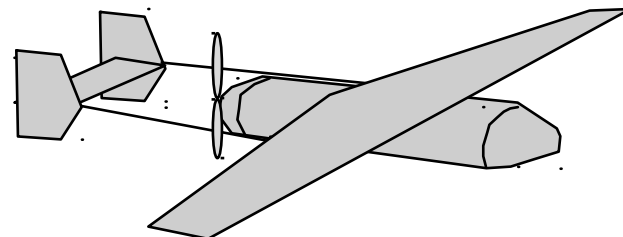
C4 & RSTA

Tactical Targeting:

- FLIRS widespread
- Day/night capable
- Electronic scan
- Phased Array Radar
- Seismic
- MMW radar

Deep Targeting:

- Extended range (500-1000km) UAV
- Multi-sensor suites
- Downlink



Communications Freq Hopping Radios

ACV 46 (SF)
ART 2000 (IR)
LVP 235 (IN)
PRC- 710 (IS)
SEM 173-193 CNR
System (GE)

Automated Fire Control System

Kapustnik-B (RS)
Vivary (RS)
AS 2000 (SF)
BATES (UK)

Communications:

- COMSAT
- Cellular telephones
- Fiber-optics
- Spread-spectrum
- Frequency hopping

Satellites / Precision Navigation:

- Computerized support -
- GPS / INS
- Real time/near real time downlink -
 - Photo
 - Remote sensing
 - Data

UAV 50 to 100KM Range

ASN-104/105 (D-4) (CH)
Fox AT1 (FR)
AS 2000 (SF)
Brevel(FR/GE)
Vulture (SF)

UAV 100+KM Range

TU-143 Reys (DR-3) (RS)
Fox AT2 (FR)
CL-289 (CA)
Meteor Mirach 100 (IT)
Meteor Mirach 150 (IT)
Scout (IS)
Heron (IS)
Harpy (IS)

IMPLICATIONS: Foreign deployed rapid sensing, target acquisition, and communication systems pose a serious threat to U.S. forces ability to function effectively.

Threat Assessment

- Restricts Freedom of Maneuver in Single Dimensional Operations
- Mixture of High Tech, Hybrid and Conventional Capabilities
- Maximizes Cover, Camouflage and Deception
- Fights on Own Turf, Knowledge of Terrain, Weather and

**Not Just a Mission for Army Aviation,
It is a Combined Arms/Joint Force
Mission**



**Pantzr S-1 SP AD
System**

Aviation, as part of the Combined Arms Team

Execute the enduring missions in support of Commander's scheme of maneuver in Joint and Combined arms environment

Specifically:

- Provide agility, lethality and responsiveness throughout depth of battlespace
- Provide direct fires and maneuver unconstrained by terrain through mutual support of ground forces
 - Create Overmatch with reinforcing combat power through fires and maneuver
 - Force enemy into multi-dimensional fight
 - Orchestrate direct and indirect fires to force enemy from position of strength
- Shape and isolate decisive operations
 - Deny enemy freedom of movement
 - Provide cognitive man-in-the-loop C2 to acquire, fix and destroy targets
- Target acquisition and precision fires at extended ranges
- Vertical dimension of Combined Arms Team

This is Why We Have Army Aviation...

Artillery Implications

Aviation Operational Environment Highlights:

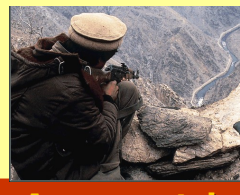
- a wider spectrum of operations, increased threat technological capability and unpredictability leading to a more **complex and challenging range of operating environments** . .
- In association with an Adaptive and Adoptive Threat
- **A Challenge for Independent Maneuver**
- **Suggests Combined Arms operations**
- **Extremely lethal, offensively oriented air defense environment**
- **Degradation of U.S. technological superiority**
- **Changed target sets**
- **Challenges US preferred method of Warfare....Standoff, Precision**



Emerging Military Capabilities



Urban/Complex Terrain



Asymmetric Threats



Emerging Military Strategies

Conclusions

Distributed,
Simultaneous
Operations

Critical
Vulnerable
Space Links

Non-traditional
Coalitions



Homeland
Security

Peer/Near-Peer
Competitors

... this Operational Environment highlights:

- a wider spectrum of operations, increased unpredictability and a more **complex range of operating environments** . . .

... and adversaries that:

- are **WATCHING, LEARNING and ADAPTING**
- will marginalize the strengths of our strategy by **placing force projection operations at risk**
- can accept - not losing - as a strategic goal
- are modernizing in light of late 20th Century lessons
- will change from conventional operations when threatened and pursue an asymmetric strategy

Asymmetric
Threats

Noncontiguous
Battlefield

Complex
Terrain

Unblinking
World
Media

Rapidly Changing
Information Technology
And Increased
Information Demands

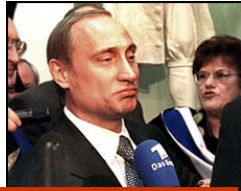
Limited Existing
Infrastructure



Regional
Competitors

Non-state
Actors

Divergent
Military
Capabilities



Changing dynamic requires new and flexible military capabilities